

UTREDNING

The last intact forest ecosystems of the Archangelsk region

A summary report from 7 expeditions into Archangelsk remote forests 1997 - 2011.



Ole Jakob Sørensen, Valery Efimov, Alexander Davydov,
Victor Mamontov, Sune Sohlberg, Aimo Saano og Tapio Lindholm



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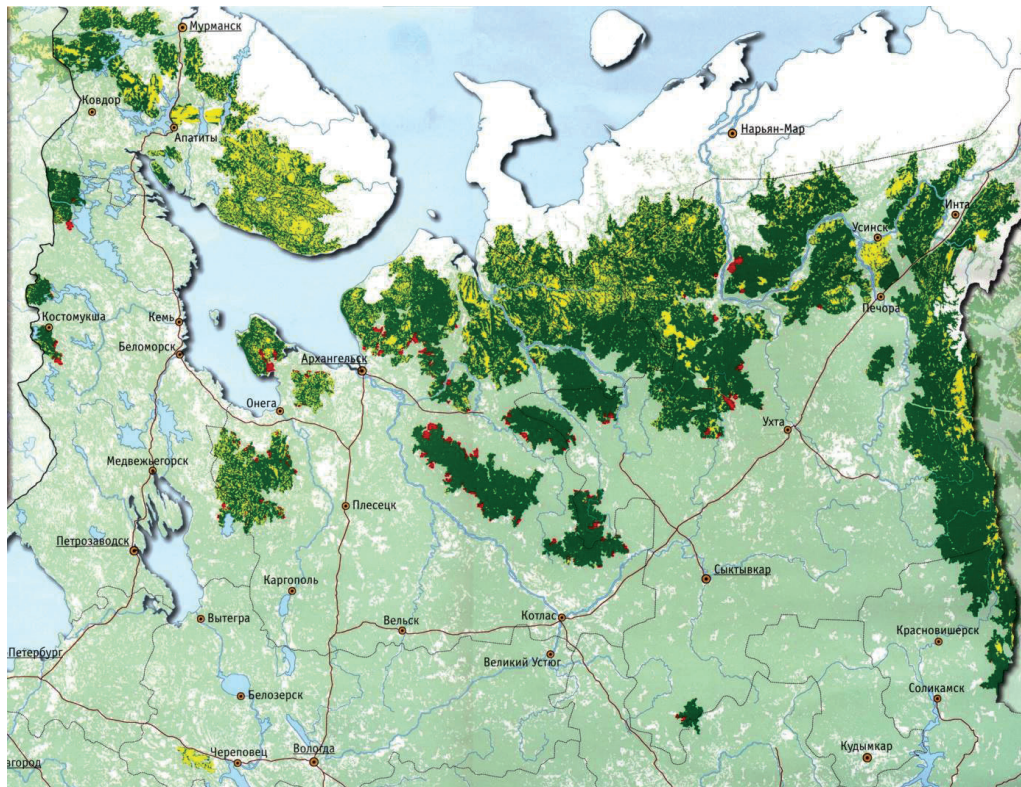


Figure 1. The last intact old-growth Boreal forests in the North-West Russia. Map of Greenpeace of Russia, 2001.

Photo front page: The tent camp at Pioza River 2009:
Photo: Alexander Davydov

PREFACE

Since 1997 seven international expeditions have been conducted to remote forests of the Archangelsk Region with the purpose to get updated information on these forests' ecological status with a possible purpose to establish protected forest areas in the Oblast. All work has been done with general support from the Russian authorities and is a part of the Barents Region's several cooperation strategies. The initiative in itself was all Russian, and the international cooperation has developed over time.

The organizers of the expeditions have been the environmental bodies and research organizations of Russia;

- The Russian Academy of Sciences (RAS), Institute of Ecological Problems of the North - the Ural Branch,
- The Vodlozersky National Park and - The Russian Geographic Society.

The expeditions have been joined by representatives of the departments of forestry and nature protection of Russia on Federal, Oblast and Rayon levels, and also the Russian Academy of Sciences (Karelian Branch), the Archangelsk Forest Management Expedition, the Northern Branch of VNIIOZ, the All-Russian Institute of Game and Animal Breeding, the SevPINRO, The Scientific Center of Associations of Zapovedniks and National Parks of the North-West Russia, the Institute of Ecological Problems of the North of the Ural Branch of the Russian Academy of Sciences (IEPS UrO RAN).

International participation from Finland has been The Finnish Environment Institute (SYKE), The University of Helsinki and The Metsähallitus, from Norway The Directorate of Nature Management (DN), The University College of Nord-Trøndelag (HiNT), the Norwegian Inst. for Agricultural and Environmental Research, Svanhovd (BIOFORSK), and The Norwegian Polar Institute and from Sweden The Swedish Environmental Protection Agency, The Administration of Västerbottens County and The Administration of Norrbottens County). The expedition to the "Onezhskoe Pomorje in 1997" was also accompanied by experts from Germany (The University of Hamburg, the German Federal Agency of Nature Protection and the German Union of Nature Protection).

This report is prepared for the Barents Euro-Arctic Region's 11th. meeting of Ministers of Environment from Russia, Sweden, Finland and Norway in Inari, Finland 4 – 5th. December 2013 and as such it will be a part of the discussions at this meeting.

The authors responsible for this summary report are all experts in boreal forest ecological aspects and nature management, and they all have extensive field experience from Fennoscandic as well as Russian forests. They all have participated in all or some of the expeditions.

Acknowledgments: We will acknowledge and thank all the participating nations and/or institutions who have funded these expeditions and made it possible to now present this summary report and recommendations that hopefully might result in protection of a network of intact forests in Archangelsk Oblast which is important for the preservation and development of western taigas biodiversity in itself, but also as ecological taiga forests heritage sites for coming generations. Russian authorities have had the overall practical as well as economical responsibility for the expeditions. The additional economical and expert support from the other Fennoscandic countries have been substantial to run the expeditions, and as such been the base for a lot of related activities, personal as well as institutional network and cooperation between the involved countries.

At the end of this preface we would like to acknowledge the group of experts inspired by International Environmental Expedition “Belomorsko-Kuloiskoe Plateau 1998” who started the planning of an international workshop on protected areas in the Barents Region. This workshop has later evolved into the Habitat Contact Forum of the Barents Region – essential for the establishment of these expeditions and their results.

Steinkjer – Norway November 23rd. 2013

***Ole Jakob Sørensen, Valery Efimov, Alexander Davydov,
Victor Mamontov, Sune Sohlberg, Aimo Saano, and Tapio Lindholm.***

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The bog landscape surrounding the Pioza River.



The remote, old settlement of Ura Village with the Ura River in front.

SUMMARY

Based on the initiative from the State Committee of the Environmental Protection of Archangelsk Oblast in 1993, the Program of the creation of new protected areas in Archangelsk Oblast became approved by the Oblasts administration in 1996. During the years 1997 – 2011 there has been 7 International expeditions into Archangelsk remote forests with the purpose to evaluate these forests for a possible network of protected areas.

Participants have come from Archangelsk, Komi and Karelia in Russia, and Finland, Norway and Sweden in the other Barents Region Countries. The financial base has been Russian, with some financial support from the cooperating countries.

The expeditions have documented that in Archangelsk there are vast, unique areas of pristine forests. Much of it is old forests, but in a complex system of forest succession stages following natural fires and internal gap dynamics. Human influence of these forests is still insignificant and today they serve as the best preserved, large areas of its kind in Europe.

Due to these international expeditions the areas ecological value are better documented, and so far one national park is established (The Onezhko-Pomorye National Park in 2013).

Bilateral and multilateral cooperation between the partner countries of the Barents Region is achieved as well as between scientific institutions and persons. The Barents Regions Habitat Contact Forum has developed due to this network, established and based on the expeditions.

The authors of this paper, all experienced researchers and managers of boreal forests and nature in general, who also have participated in all or several of the expeditions, strongly recommend continuing the work to establish protected areas based on the results of the expeditions. We also recommend a priority list for this work in the future, but processes could also go in parallel.

The authors advice starting work on the forest areas between the Severnaja Dvina and Pinega Rivers, where the Yula River basin is centered, due to the urgent need to solve the many and complex socio-economic factors and long time logging contracts existing there.

The authors also recommend and encourage continuing the work to establish new expeditions into the areas for more detailed research on the areas ecological qualities like what is so far conducted only for the Kozhozero area.



An old meander of the Pioza river have here made a u-formed lake. Such lakes are regularly seen along the Pioza River.



Complex internal structures are common in old, gap dynamic formed forests – like this example from the Pioza River.

1. INTRODUCTION

1.1 The historical background and purpose for the 7 expeditions into Archangelsk remote forest areas.

In 1993, on the instructions of the State Committee of the Environmental Protection of Archangelsk Oblast, experts of The North Department of All-Russian Institute of Game and Animal Breeding (SO VNIOZ) performed a “Gap-Analysis” for a possible network of “Protected Areas” of the Archangelsk Region/Oblast.

As a result of this work a Program of the creation of new Protected Areas in Archangel Oblast was designed for a period 1996-2005. This Program was approved by the Administration of Archangelsk Oblast in 1996.

The program proposed to organize a number of large Protected Areas for the protection of intact boreal forests on the remote territories. In particular there were proposals to organize a National Park “Onezhskoe Pomorje” on the Onega peninsula, a National Park on the Belomorsko-Kuloiskoe Plateau, a Zakaznik (Nature Reserve) in the area between the rivers of Severnaya Dvina and Pinega and a Zakaznik in the basin of Mezenskaya Pizhma.

In order to realize this Program it was necessary to conduct several ecological surveys/excursions into the areas as a joint project work, and with a substantial financial support. Since then 7 international ecological expeditions have been organized during the years 1997-2011 into the different areas of the Archangelsk Oblast in order to evaluate the conditions of natural and cultural heritage of these areas for possible protection in the forms of Protected Areas and to draw the attention of the experts of the Barents Euro-Arctic Region (BEAR) for its international ecological value. The organization of the expeditions was approved by The Ministry of Nature Recourses of the Russian Federation and the Barents Euro-Arctic Council’s “Working Group for the Nature Protection”.

1.2. Some ecological and historical aspects of the Boreal Forests – The Taiga.

The boreal forest of Eurasia and North America is one of the large BIOMES of the Earth where Coniferous forests of several species of Pines (*Pinus* sps.), Spruce (*Picea* sps. and *Abies* sps.) and Larch (*Larix* sps.) predominate together with boreal leaf trees as Birch (*Betula* sps.), Aspen (*Populus* sps.), Alder (*Alnus* sps.), Rowan-tree (*Sorbus* sps.), and Willows (*Salix* sps.). Even though tree species might differ from the east to the west and on each side of the Bering Strait, forests structures and the forest ecology have much in common. This biome is all snow covered during winter with a short growth season. Natural forest fires are the dominant way of renewing forest succession (for almost 70 % of its area), and for forest complexes of old age gap dynamics induced by

parasitic fungi, bark beetles, wind storms and the snow breaking down trees are important ecological factors in shaping the landscape and its dynamics.

Many animal species are typical and common for this biome, - the Moose (*Alces alces*), the Beaver (*Castor fiber* and *C. canadensis*), and the Brown Bear (*Ursus arctos*), have today its main world distribution in the biome. For birds, The Goshawk (*Accipiter gentilis*) and The Great Grey Owl (*Strix nebulosa*), together with the Hazel Grouse in Euro-Asia (*Tetrastes bonasia*) and the Spruce Grouse (*Canachites canadensis*) and The Ruffed Grouse (*Bonasa umbellus*), and the Siberian Jay (*Perisoreus infautus*) and the Grey Jay (*P. canadensis*) in North America are typical species for the biome sharing many common features and using the habitat year round.

The biome is also characterized by its numerous small and large mire/bog complexes, numerous small and large lakes and ponds (especially in areas covered by ice during the last glaciations), and river systems where numerous species of freshwater fish are present. The Pike (*Esox otus*) and the Perch (*Percha fluviatilis*) are common species in the lakes and slow running rivers, as Brown Trout (*Salmo trutta*) and the Grayling (*Thymallus thymallus*) are species better adapted to running waters and almost all over common for this biome. Wildlife density are commonly most abundant near water systems, partly being dependent on summer grass habitats on ice-scraped river beds and willows during winter times, habitats representing permanent primary succession stages. During the ice melting in spring areas of forests are also regularly flooded. This process often deposits earth and minerals creating fertile areas that can grow into really old forests and habitat spots of rich biodiversity and also representing the oldest parts of these ecosystems succession stages.

Man explored and settled this biome along the rivers, our living being based on the use of fish, hunting of waterfowl, grouse birds, moose and fur animals and collecting berries, out of which different species of blueberries (*Vaccinium myrtillus* and *V. uliginosum*, *V. vitis-idaea*, Crowberries (*Empetrum* sps.) and *Rubus* species like the Cloud Berries (*Rubus chamaemorus*) was their main source for sugar and Vitamin C.

In this biome trees have been an unlimited resource for man since ancient times, used for fire wood and to build lodges, cabins and permanent houses, and large logs (often from aspen trees) was used for making boats and floats. In the North America Birch bark canoes are typical for some areas. Also in North Russia the Birch bark was used similarly, and until 20th century Aspen trees have been used for river boat building (osinovka - aspen tree slotted boat). New use of forest resources of trees, game, fish and berries have always been explored and developed. Even though this long time exploring of forest resources, man's use of these forests have been concentrated to the surroundings near settlements of different kind. Most of this original area use by man has never changed the ecosystems natural processes and threatened/

changed its biodiversity.

Vast areas of the original taiga forest biome is still quite intact, but at least in its southern parts and in Fennoscandia, its resource use have increased rapidly over the last 400 years. This has partly been due to an increased need of timber in the larger cities of Europe, where lack of local timber created a market for timber exported from Fennoscandia and shipped to the continent and Great Britain. At the same time exploitation of rock minerals (mainly iron and copper) from Scandinavia increased - and local timber was used in these processes and changing forest landscapes around these sites. Vast areas of the Fennoscandian taiga forests were exploited 150 years ago, and remaining forest stands was of poor timber quality. In Finland, the burning of forest plots were also common to produce grain fields and agriculture lands, - and agriculture-induced forest area use, that partly also was left into a forest re-growth. Re-growth of forest was still all over nature based.

As production of paper was invented and developed during the 1800th, industrial use of smaller timber logs became common, and the industrial use and economical value of forest increased. Forestry then became a profession and subject for specific educational programs where skills in planning of logging operations, administration and mapping of the forest resources were improved to a new level. The concepts of sustainable timber production and use became the world's first formal initiative in sustainable resource use. Timber was recognized as a renewable resource where re-growth and use could be planned in a 100 year perspective. Later on (approximately the 1950th) the concept of Multiple Use of all forest resources became a concept focusing that forests gave more products to man than represented by the tree-logs; - game and berries and mushrooms, but also fish and clean water and as a place for recreation improving human health.

The concept of sustainable use has today evolved to also include care for all biodiversity. In this context it includes what effect long time and all terrain forestry activities might have on biodiversity of the boreal biome, - all its species abundance and distribution, population's viability as well as ecosystem variations and ecosystem services.

The more intensive landscape covering forestry is anyhow a new phenomenon. Its history have some differences between the countries, but clear cutting of old stands, replanting of new trees and cultivation of young stands to improve productivity of the valuable trees is now a common practice in the boreal forests. Leaf trees, always coming naturally as a first stage of a secondary succession, is normally removed in the cultivation process in Fennoscandia, but less so in Russia. At least for the Fennoscandian forests we thereby create more homogenous, even aged stands of spruce or pine with poorer conditions for biodiversity. In Russia this is many places different as young forests so far mainly have been left to its natural regrowth processes. In Fennoscandia, and in Russia, draining of mires and bogs to increase forested areas has also changed the forest landscape in structure and tree composition.

The taiga forests are also one of the active parts in the global CO₂ cycle – continually storing CO₂ as biomass and wood is build up. They serve as a C-sink and C-store (Carbon storage) of importance at a global level. The C-store (Carbon storage) is divided into several levels of different capacity and time-lag through the C-biogeochemical cycle. Living trees absorb CO₂ for as long as the tree is alive, debris from the tree will become a part of the debris-layer and over time raw humus layer at the forest floor before becoming a part of the forest soil. C-degradation can happen rapidly for some part of the debris, but also slow, and trunks might have just a long time of degradation as the tree itself has been alive – hundreds of years. Forest fires create long lasting particles of C mixed into these layers. The productivity and rapid C-store (Carbon storage) will be highest in medium aged or young forests, but old-growth stands might store C over a longer time period. We have fairly good knowledge of the forest productivity, but less on the C-storage capacity and time for recycling of C in different forest categories and succession stages including how modern forestry effect C-cycle over a long run. Remaining old-growth natural forest are in this aspect important living laboratories of global importance and should be given research priority. If so there will be a need for areas of intact taiga ecosystems at landscape level in the future for the benefit of man and our understanding of nature processes and our influence on natural systems over the time. Framstad et al. (2011, 2013) have recently given a first review of this complexity.

These changes of the taiga biome landscape are in many ways common for the whole region, but have come to different “levels” in different parts and countries of the biome. The western parts of the continuous boreal taiga are the most affected by human use. Large intact, natural forest hardly exists in Fennoscandia today, and even smaller areas of natural forest are seldom seen, and mainly spread. Many forest reserves do have visible tracks of human use, including some selective logging.

In the Barents Region today, large areas with natural and intact boreal forests at landscape level can only be found in Russia. These areas represent today the only possibility to preserve the natural boreal forest habitats in this western part of the biome. Their importance for science is unquestionable. Only here research can be performed to better understand and know this taigas ecology. And only in these large intact forests can forests species evolution continue in relatively undisturbed situations. The expeditions have taught us that its biodiversity is natural and complex and can even today show up many species now red listed in Fennoscandia where we know that long time forestry activity have changed their living requirements negatively.

From an environmental viewpoint, the general idea of how a landscape protection system could be arranged was presented by Efimov (2007). Figure 1 and 2 show the map that visualize the idea of a net of large and smaller protected areas that will create connections and possibilities for exchange

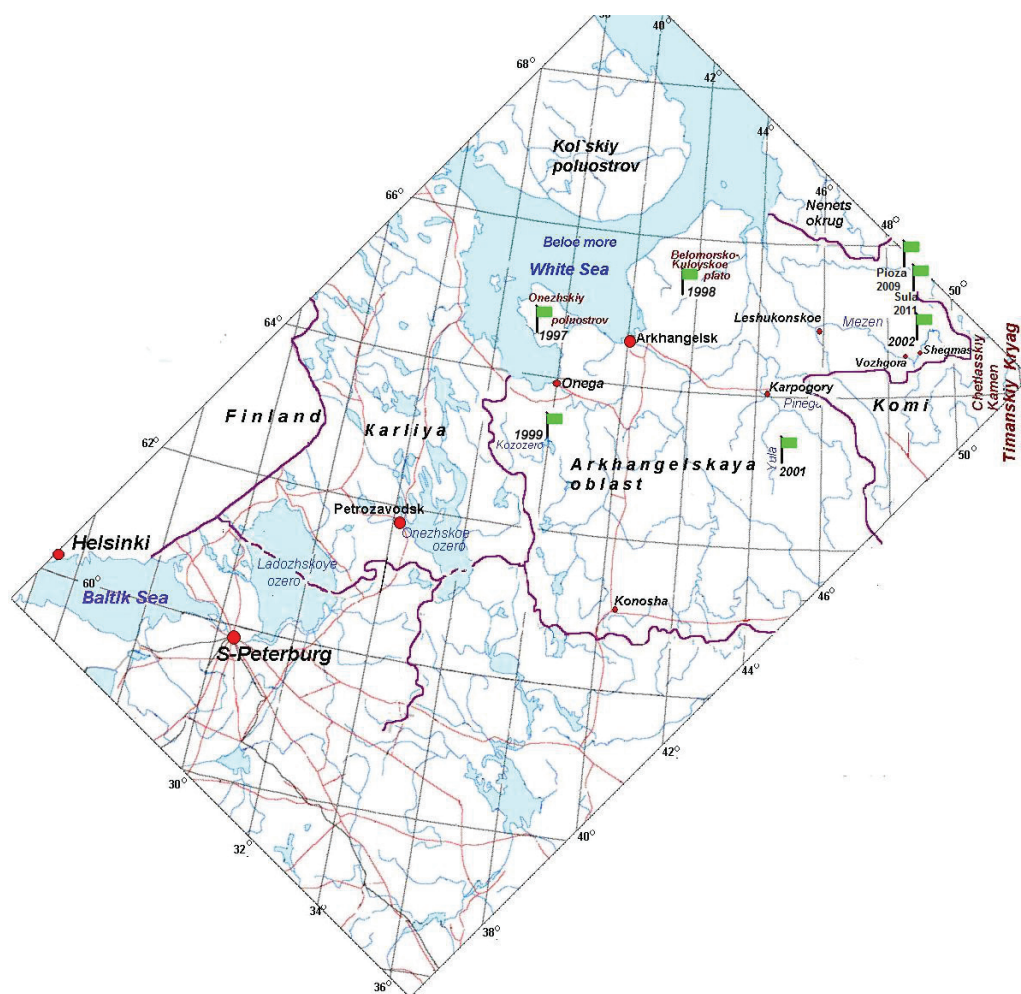


Figure 3. Map covering Arkhangelsk Oblast where expedition sites and year for expeditions are marked and chronologically numbered like presented in this report.

2. THE EXPEDITION SITES

The four original selected sites for possible National Parks or Nature Reserves together with 3 additional sites are given in Table 1 with some basic information. Their locations are given in Figure 3. All expeditions have had participation from Russia, Finland, Sweden and Norway.

Table 1. The 7 expedition sites in Arkhangelsk Region with some basic information on possible area size of interest for protection and geographical location.

Site name	Geographical coordinates Central part	Rayon(s)	Areas size	Bio-geological information m.a.s.	Expedition year / Comments
Onezhsky Peninsula and coast	64° 50' 00" N 37° 10' 00" E	Onezhsky and Primorsky	More than 500 000 Ha	Northern Boreal Coastal Forests including river systems and coastal water. 0 - 150 m.a.s.	1997, July
Belomorsko-Kuloiskoe Plateau	65° 30' 00" N 42° 10' 00" E	Primorsky, Mezensky and Pinezhsky	About 2 Million Ha	Mid - and Northern Boreal and Sub-Tundra Taiga forests and mires. Karst-forests. Soyana River drainage. 10 - 100 m.a.s.	1998, August.
Kozhozero	63° 10' 00" N 38° 05' 00" E	Onezhsky	About 700 000 Ha	Middle and Northern Boreal Taiga forests and mires	1999, August.
Yula River Basin	62° 45' 00" N 44° 30' 00" E	Pinezhsky. Vinogradovsky and Verhnetoemsky	1,5 Million Ha	Middle Boreal Taiga forests and mires	2001, August.
Mezenskaya Pizma River Basin	65° 10' 00" N	Leshukonsky	About 500 000 Ha	Northern Boreal and mires.	2002, August-September
Pjoza River Basin	65° 10' 00" N	Mezensky	About 500 000 Ha	Sub-Tundra Taiga and mires, Northern Boreal forests	2009, August
Sula River Basin	49° 30' 00" E	Leshukonsky	200 000 Ha	Northern Boreal Forests	2011, August



Lush and productive grass and flower vegetation at the banks of the Yula River, August 2009. This vegetation type is kept for long time due to the regular scraping of ice during the spring flood.



Three fire scars in a pine log from Pioza River forests. The fires are dated back to the 17th Century.

3. THE EXPEDITIONS

3.1 The Onezhsky Peninsula Expedition - 1997.

The Expedition: The “Onezhskoe Pomorje 1997” expedition was in July 1997, organized and chaired by Oleg V. Chervyakov, the Director of Vodlozero National Park (Karelian Republic and Archangelsk Region). During the expedition a round tour was organized by helicopter, sailing around the Onega Peninsula by the boat m/s “Shabalin” and several hiking routes. The expedition visited the most interesting environmental areas of the peninsula and had meetings with the local authorities and residents of the Pomor villages; Purnema, Lyamtsa, Pushlakhta and Letnyaya Zolotitsa.

The landscape and its biodiversity: This landscape is to 60 % covered by forests, mainly consisting of spruce (83 %) in the inland and pine stands (17 %) nearer to the coast with occurrences of the Siberian Larch (*Larix sukaczewii*). The forests, mainly of old age have low influence of human activity. This area represents the last and only big stand of old-growth intact taiga forests in Europe surrounded by the waters of White Sea, coastal and marine ecosystems characterized by the extremely high level of biodiversity which contains the habitats of the precious species of sea mammals; The Greenland seal (*Phoca groenlandica*), The Ring seal (*Phoca hispida*) and The White Whale (*Delphinapterus leucas*). All the rivers of the peninsula have spawning areas of the Salmon (*Salmo salar*), the Bull trout (*Salmo trutta*) and the introduced Humpback Salmon (*Salmo xx*).

The flora diversity is uniquely represented by approximately 800 species (Шмидт 2005) and plant societies of arctic, arctic-alpine, coastal and boreal flora elements of both European and Siberian origin. Among those plants there are 26 species noted in The Russian Red List of Species:

The peninsula is a junction and resting place of international importance for waterfowl migrations.

The cultural heritage - human influence: Cultural heritage of ancient times is represented here by Neolithic sites. Near Una Horns there is a cross in memory of the salvation of Tsar Peter the Great after a storm in 1693. The interior land areas show little influence of human activity, but along the coast there are old Pomor villages typical for the White Sea coast. There is a complex of monuments of this traditional Pomor culture.

Recommendations: An analysis of the contemporary net of the National Parks in Russia and in the Scandinavian countries showed that there were no other Protected Areas which could represent intact boreal forests, marine coastal forests and beach shores, sub-aqua and aquatic landscapes in a combination.

The experts' evaluation of the area considered the Onega Peninsula to be of great international value. According to the Russian legislation and the international practices its resources correspond to the status of a National Park. The main conclusion of the expedition resolution was to argue for organizing of the National Park "Onezhkoe Pomorye" ("Onega Peninsula Pomor Land").

Today status: The Recommendations of the expedition has been taken into consideration by the Government of Russian Federation, and the organizing of this National Park was included into the Program of the Development of the National Parks of Russian Federation in the Period 2000-2010.

In February 2013 the Government of Russian Federation decided to establish and organize the National Park "Onezhkoe Pomorye" with an area of 201666 hectares (including 188666 hectares of forest area and 21000 Ha of the White Sea coastal water).



Figure 4. From Pushlata Village at the coast of the White Sea. Photo: Alexander Davydov

3.2 The Belomorsko – Kuloiskoe Plateau Expedition - 1998.

The Expedition: The “Belomorsko-Kuloiskoe Plateau – 1998” expedition was organized and chaired by Oleg V. Chervyakov Director of Vodlozero National Park (Karelian Republic and Archangelsk Region) in August 1998. During the expedition a tour was organized by helicopter, travel by boats along Soyana River from Kepino to Soyana villages and hiking routes into the forests from the river beds. This river drains to the north through the middle part of the plateau and into the Mezensky Bay of the White Sea. The purpose was to evaluate the areas for protection as a national park. The expedition members also met the representatives of the Soyana village and local people to discuss problems of nature conservation and socio-economic development of the area.

The landscape and its biodiversity: The geologic history of the area shows a rich diversity of landscape formations. The plateau has a two-layered geological structure with an intermediate layer of karst/gypsy rocks with fossils of insects. There are a mosaic of biotopes of forest and forest successions, lakes, mires, and rivers ecosystems with canyons, alluvial meadows, and karst formations. The area was most likely ice free during the last ice age.

The expedition found large areas with intact old-growth forests stands which have important influence on the formation of climate of this large territory of the Barents Region. Even if this area has a Northern location, it represents a rich diversity of flora, including species characteristic for Fennoscandia and West Siberia. 26 species of mammals and 20 species of vascular plants, mosses and lichens listed in the Red Books of Russia and Archangelsk was found.

The cultural heritage - human influence: Cultural heritage are represented by archaeological sites of the Neolithic and Early Metal period and the traditional culture of old Pomor villages (Soyana, etc.) and the traditional migration routes of Nenets people of the Kanin Peninsula (Figure 4). The building of a post station on the former Mezen road must be remarked - and the Suyana Village is a cultural heritage place/ “open museum” in itself.

Recommendations: The participants regarded the areas quality to completely satisfy Russian and international requirements for establishing national parks. To establish the areas now protected as Zakazniks, possibly with some more added areas, is important to conserve the areas for the future.

A study was conducted of the public opinion of the local people of Soyana village connected with the perspectives of the creation of the National Park “Belomorsko-Koulojskoe Plateau”. On the basis of this complex research and public meeting, the borders of a future national park could be recommended. According to the recommendations of the expedition more research on the biodiversity and nature complexes and cultural heritage of the area was encouraged.

Current status: There are already established several large Zakastniks (Soyansky biological zakaznik, Primorsky landscape zakaznik, Zheleznye Vorota geological zakaznik and Pinezhsky Zapovednik on the area, but the zakazniks protection degree is regarded as weak, as there are great interest to develop the areas mineral resources as well as forest resources. It does not seem to be any progress in the work to change the status of the protected areas into a national Park. This makes the creation of a National Park “*Belomorsko-Koulojskoe Plateau*” still to be relevant and of great importance.

One of the results of the expedition was the creation of the Soyana Ecological Information Centre in 1998, which was organized with the support of the local community of Soyana village. This excellent concept has not become a success though.



Figure 5. Nenets People from the Kanin Peninsula in Soyana village.
Photo: Alexander Davydov.



3.3 The Kozhozero Expedition - August 1999

The Expedition: The “Kozhozero-1999”, expedition was in August 1999, organized and chaired by Valery A. Efimov of the Russian Academy of Sciences, Ural Branch, Inst. of Ecological Problems of the North (IEPS UrO RAN). A round trip by helicopter to get an overview of the area as well as travel along rivers, and lakes by rubber boats (135 km) and hikes into forests (40 km) gave the expedition participants at the possibility to evaluate this area (Figure 6).

The landscape and its biodiversity: This area is geologically a part of the Fennoscandic Shield - consisting of ancient, pre cambrian rocks. This area has been covered by ice during the last ice-age; - evidence is the formation of unique eskers, old sand and stone beds formed by rivers running under the ice shield and more numerous large and small lakes and ponds.

There are still large areas of old-growth middle boreal taiga dominated by spruce, but with a larger content and mosaic of pine forests than the other surveyed areas.

The biodiversity is well documented and rich including 26 rare animals and birds species in danger and more than 15 species of plants which are in the List of the Red Data Book of Russia and the Red Data Book of Archangel Region; different kind of mires ecosystems (including Karelian type “aapa” mires). Many of the documented species are regarded as endangered or threatened in Fennoscandia.

The cultural heritage - human influence: Cultural heritage is represented here by Neolithic sites, names of places of Sami, Finnish and Russian origin. A distinguishing feature of the area is the buildings and ruins of Kozhezersky Bogoyavlensky (Epiphany) monastery (Figure 7a and 7b), which started at the 16th century and sacred natural sites as the Lopsky Peninsula, the Nikodimka River and places connected with local saints. This gives the area a unique spiritual value compared to the other surveyed areas. Even though this area is more influenced by humans over centuries it has still to a large degree kept its pristine nature.

Recommendations: The recommendation of the expedition was to run a more detailed inventory of biodiversity and cultural heritage of the area, and elaborate a plan for the development of the area. This was performed in 2003-2004 and the result published as a collective monograph “Nature and Cultural Heritage of Kozhozero Land” (Efimov & Davydov 2006. - In Russian with some English Summaries). This was the first time a broad scale inventory was performed of the biodiversity and cultural heritage of the area, which confirm the uniqueness of the area and the necessity of its protection.

Current status: A Landscape Zakastnik with an area of 178600 Ha around the Kozhozero Lake was already established in 1992 by the Oblast Administration. The area is adjacent to the approximately 400000 Ha large Vodlozersky National Park common for Republic of Karelia (Russia) and Archangelsk Oblast. The zakaznik was transformed into Kozhozersky Nature Park in 2001. In 2004 the Nature Park status was changed back to regional Landscape Zakastnik (NR) and the area was increased with an additional 201605 Ha.

Due to the deficit of financing no zoning was realized and the plan for development of the territory restrained the process of moving the area to the status of Nature Park (nowadays the territory has a status a Landscape Zakastnik of Regional Significance). But the area has the value recognized for creation of a National Park - a possibility that needs to be considered, and pushed on to secure this nature complex.



Figure 6. View from helicopter of the Kozhozero Lake at the outlet of the Kozha River. Photo: Alexander Davydov.



Figure 7a. The Kozhozero Lake. The Lopsky peninsula with the ruins of the Kozhezersky Bogoyavlensky (Epiphany) Monastery. View from helicopter. Photo: Alexander Davydov.

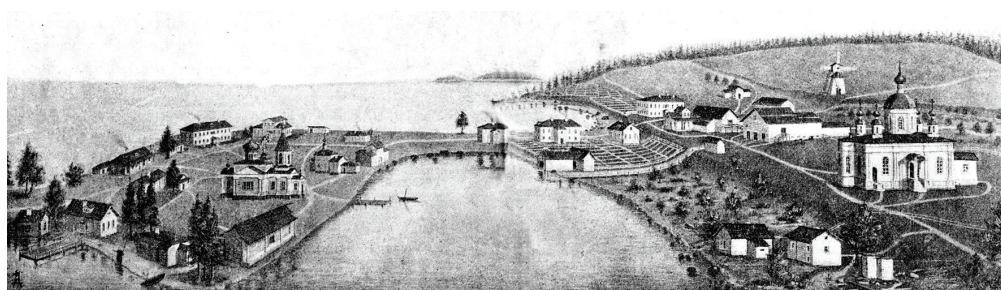


Figure 7b. Fragments of an engraving of The Kozhozero Monastery in the late 19th. Century.



Browsing marks after a few forest reindeers in a mature pine forest covered with *Cladonia* sps. near the Bludnaya River.



Typical river vegetation in the upper parts of the Bludnaya River.



3.4. The Yula River Expedition - 2001.

The Expedition: The “Yula – 2001” expedition was in August 2001, organized and chaired by Valerie A. Efimov (IEPS UrO RAN). An overview of the area was obtained by a roundtrip with helicopter for 150 km. In addition boats were used on the rivers of Yula and Ura for 40 km hikes out from the different campsites and boats for about 45 km.

Two Regional Zakazniks are located in the area: Monastyrsky (15900 Ha) in Pinezhsky Rayon and Kolonsky (37 000 Ha) in Vinogradovsky Rayon.

The landscape and its biodiversity: The Yula River Basin is located between the rivers of Severnaya Dvina and Pinega. It is the largest intact forest complex of middle boreal taiga in Europe, located in the eastern part of Archangelsk Oblast. This area was not covered by ice during the last ice age, and can be regarded as a plain with sand dunes of different depth and soil quality. Mires and bogs do not make any significant part of these forests, which differs from the other expedition sites.

The total area of this intact forest landscape was more than 1500000 Ha in the late 1990th. The area of intact forest has been reduced since the expedition due to forestry activity during the last 12 years.

The expedition’s participants evaluated the areas to represent a landscape complex of natural, typical and unique middle taiga forests. It includes several different types of intact forests on large areas with unique formations of old-growth forests with multiple traces of pyrogenic/forest fire successions of different age that can easily be observed in nature. This results in a unique internal mosaic structure. A rich biodiversity of the areas of unique and typical Middle taiga complexes with small influence of industrial activity was found. Spruce stands typically averaged 160 years of age and often more than 250 years old. In pine forests tree stands were often multilayered with model trees up till 450 years of age.

Since the expedition time, these forests have become affected by drought inducing attacks by bark beetles (*Ips* spp.) and parasitic fungi weakening the stems of old spruce combined with wind storms creating small gaps is a part of this complex dynamics of dying trees in this region and other parts of Archangelsk Oblast. Forest structures were studied in 2005 and examples are given in **Appendix 3a**.

The expedition discovered more than 20 plant species represented in the Red Data Book of Russian Federation and the Red Data Book of Archangelsk Region. A rich biodiversity was revealed of raptor birds like the Golden eagle (*Aquila chrysaetos*), White-tailed Eagle (*Haliaeetus albicilla*), Osprey (*Pandion haliaetus*), Common Buzzard (*Buteo buteo*), Honey Buzzard (*Pernis apivorus*), Black Kite (*Milvus migrans*), Goshawk (*Accipiter gentilis*), Sparrow Hawk

(*A. nisus*), Peregrine Falcon (*Falco peregrinus*), Hobby (*F. subbuteo*) and Ural Owl (*Strix uralensis*), high density of hunted animals like the Marten (*Martes martes*), Squirrel (*Sciurus vulgaris*), Otter (*Lutra lutra*), Bear, Wolverine (*Gulo gulo*), Siberian Chipmunk (*Tamias sibiricus*), Capercaillie (*Tetrao urogallus*), Moose and Wolf (*Lupus lupus*) and there is a small population of forest wild reindeer.

The rivers have more than 15 species of fish including salmon and grayling in addition to perch, pike and other kind of whitefish of the carp family, and mollusks (*Anodonta* sp.)

Bird societies were studied in the upper Yula River basin in June 2005 and compared with natural, but over time selectively logged spruce forests of Norway. Results showed that the species diversity were comparable (Appendix 3b), but the density of woodpeckers and hole-nesting birds typical for the no-migrating taiga birds were astonishingly higher, reflecting the different amounts and importance of dead wood in these forests (Thingstad et al. 2006, 2009).

The cultural heritage - human influence: The cultural heritage is represented by the remote Ura Village with unique monuments of peasant wooden architecture of 19th century and a number of river boats made in the old tradition – osinovka (aspen tree slotted boats). Along the rivers there are cabins for hunters and fishing open for private use, and visitors and fishing tourism is common in the lower parts of the river.

The experts recommended the inventory of the area, and to establish a Landscape Zakaznik (NR) including an international field station for research of old-grove intact forests.

Current status: Unfortunately, any type of protected areas has so far not been organized in this large forest complex because all the forests already were rented by timber-cutting companies. There still remains an area approximately 1 000000 Ha of intact forests.



Figure 8. The industrial cuttings of forest in the area between the Severnaya Dvina and Pinega Rivers 2001 as viewed from the helicopter.
Photo: Alexander Davydov.

The NGO's, such as WWF and Greenpeace have later on had an intensive dialog with the timber-cutting companies in order to organize a Landscape Zakaznik in the forest stand between Severnaya Dvina and Pinega rivers. The result of this dialog has been accepted by timber-cutting companies to set aside a 10 year moratorium for cutting of timber on the territory covering more than 400000 Ha.

According to the development concept for the system of Protected Areas of Archangelsk Region, a plan to organize a Landscape Zakaznik on this territory is in place. Nowadays WWF (Archangelsk) has worked out the environmental attributes of this area (which are important in deciding how to organize the protected area), and the contents of how to organize the process to eventually establish this Protected Area. This project is now presented to the Government of The Archangelsk Region.



Figure 9. The participants of the “Yula-2001” expedition at a unique Pine tree.
Photo: Valery V. Efimov (junior).



Figure 10. An old house in the remote Ura Village. Photo: Alexander Davydov.



3.5. The Mezenskaya Pizhma Expedition - 2002

The Expedition: The “Mezenskaya Pizhma – 2002” expedition was in August 2002, organized and chaired by Valery A. Efimov (IEPS UrO RAN). The expedition was organized according to the Declaration of the Council of Ministers of Environment of BEAR and plans of bilateral cooperation of Russia with Finland, Norway and Sweden in the North-West Russia. During the expedition a round tour by helicopter for approx. 100 km was organized, travelling along rivers by boats for 20 km and on foot into the forests for approx. 45 km.

The landscape and its biodiversity: The area is located in eastern part of Leshukonsky Rayon bordering the Komi Republic covering approximately 500 000 Ha. The Ust-Chetlassky Regional Zakaznik (4000 Ha) has been located in this area since 1987. The reasons to select this expedition site were its complex of natural heritage, the unique landscapes of the border area of sub-zones of Northern and Middle taiga and the intact forest stands of different types. In general the tree age average was about 160 years, with some trees up to 450 years. There are forests of different formations (Spruce, Pine, Larch and Birch) in the Mezenskaya Pizhma valley. The occurrence of relict larch trees is rather frequent, and a forest stand with larch dominance covering about 5 000 Ha was found. The other parts of the territory consisted of mixed, intact forests of Spruce and Pine, but Spruce and Larch dominated. The mires of all types are represented, and mires flora diversity was richer near to brooks and small rivers. The complex of plants is otherwise typical for intact forest.

The forests of Mezenskaya Pizhma are unique. Currently in Europe there are no similar landscapes of this size, by its formation and holocoenotic structure of forest ecosystems.

The area has the highest altitudes in Archangelsk Oblast's - the highest point being 471 m.a.s.

The expedition discovered about 20 species of plants mentioned in the Red Data Book of Russia and Red Data Book of Archangelsk Oblast. A rich biodiversity of mammals and mammal raptors, birds and bird's raptors was described. There are more than 15 fish species in the rivers; the most valuable are Salmon, Hunchback salmon, Bull trout, Whitefish, and Grayling.

The cultural heritage - human influence: In cultural heritage Shegmas village is most interesting as a remote traditional settlement with wooden architecture according to traditional kind and plan. Also a system of hunters' huts was discovered and described. In the 1950th a number of bylinas (Russian epic) of the ancient Great Novgorod cycle were described, because Mezenskaya Pizhma was a historic route of the penetration of the Russians to Pechora and then to Ural and Siberia.

Along the Sula River an old post and transport route for horse carriages between Archangelsk and Komi exist with remote old settlements still remaining at “Lower Sula” and Fominskaya.

The Neolithic archaeological sites of the 2nd Millennium BC are represented there.

Recommendations: The participants of the expedition, the experts conclude to recommend the necessity to protect the area by the organizing of the new National Park. The Institute of Environmental Problems of the North of the Ural Branch of the Russian Academy of Sciences (IEPS UrO RAN) in 2004 prepared an environmental justification for the organization of National Park “Tymansky” with the area about 380 000 hectares.

The Administration of Archangel Region has so far protracted any decision of the recommendations in question.

Current status: Nowadays the regional administration has been somewhat indifferent to the recommendation to organize a Landscape Zakaznik. Nowadays IEPS UrO RAN is working out the new environmental justification of the protected area, also taking into consideration the new data we got after the expedition to Sula River in 2011. This is all according to the concep of the development of the network of Protected Areas.



Figure 11. The Shegmas village on the Mezenskaya Pizhma River.
Photo: Alexander Davydov.



3.6. The Pioza Expedition - 2009

The Expedition: The “Pioza-2009” expedition was in August 2009, organized and chaired by Valery A. Efimov (IEPS UrO RAN). During the expedition a round trip by helicopter (100 km) was organized, 60 km by boats along the rivers of Pioza, Rochuga and Bludnaya (Samosara) and hiking for about 35 km from the rivers and into different forest and mires and old settlements/grass fields.

The landscape and its biodiversity: The Pioza River basin is characterized geologically by being an old alluvial plain. There are layers of old marine clay sediments often observed at the edges of the river sides, covered by sand dunes. The characteristic feature of the area is presence of natural forest corridors along the rivers, which connected large territories of mires ecosystems into a unified nature complex with rich biodiversity (**Figure 12**). The intact forests, especially old-growth pine forests have several traces of pyrogenic successions (there are some separate trees more than 300 old). The alluvial meadows with Spruce forests (often on clay deposits) are the most productive. Spruce trees being more than 35 meters high with trunk diameter more than 1 meter was found. This is a unique biological phenomenon for these northernmost forests above 65° N.

Among the animals, typical for North taiga, the characteristic feature of the Pioza drainage are a high density of bears and a population of the Wild Northern Forest Reindeer (*Rangifer tarandus fennicus*). The river's edge forests were frequently used by moose. The North-East population of the Wild Northern Forest Reindeer distributed also in the Pioza River basin has decreased since the 1970-ies (7,5 thousand animals) till 2009 (1,5 thousand animals). The tracks of the in Europe Redlisted and endangered species European mink (*Mustela lutreola*) and the Otter were found.

39 species of birds were observed, mainly species typical for the forest and river biotopes. Among these raptors were widely presented: White Tailed Eagle, Osprey, Honey-Buzzard, Goshawk, Hobby and Merlin (*F. columbarius*). On the bogs and lakes Common Cranes (*Grus grus*) and Wooper Swans (*Cygnus cygnus*) were observed, and Bean Goose (*Anser fabalis*) had nestlings in the streams.

Among wood decaying fungi several species now redlisted in Fennoscandia were rather commonly found, but also the seldom observed *Skeletocutis lilacina*, *Amylocystis lapponica*, *Gloeophyllum protractum*, *Perenniphora subacida* and *Fomitopsis rosea* can be mentioned. *Inonotus rheades* and *Ganoderma applanatum* was found on some old aspen trees. The last species probably represent a northern record.

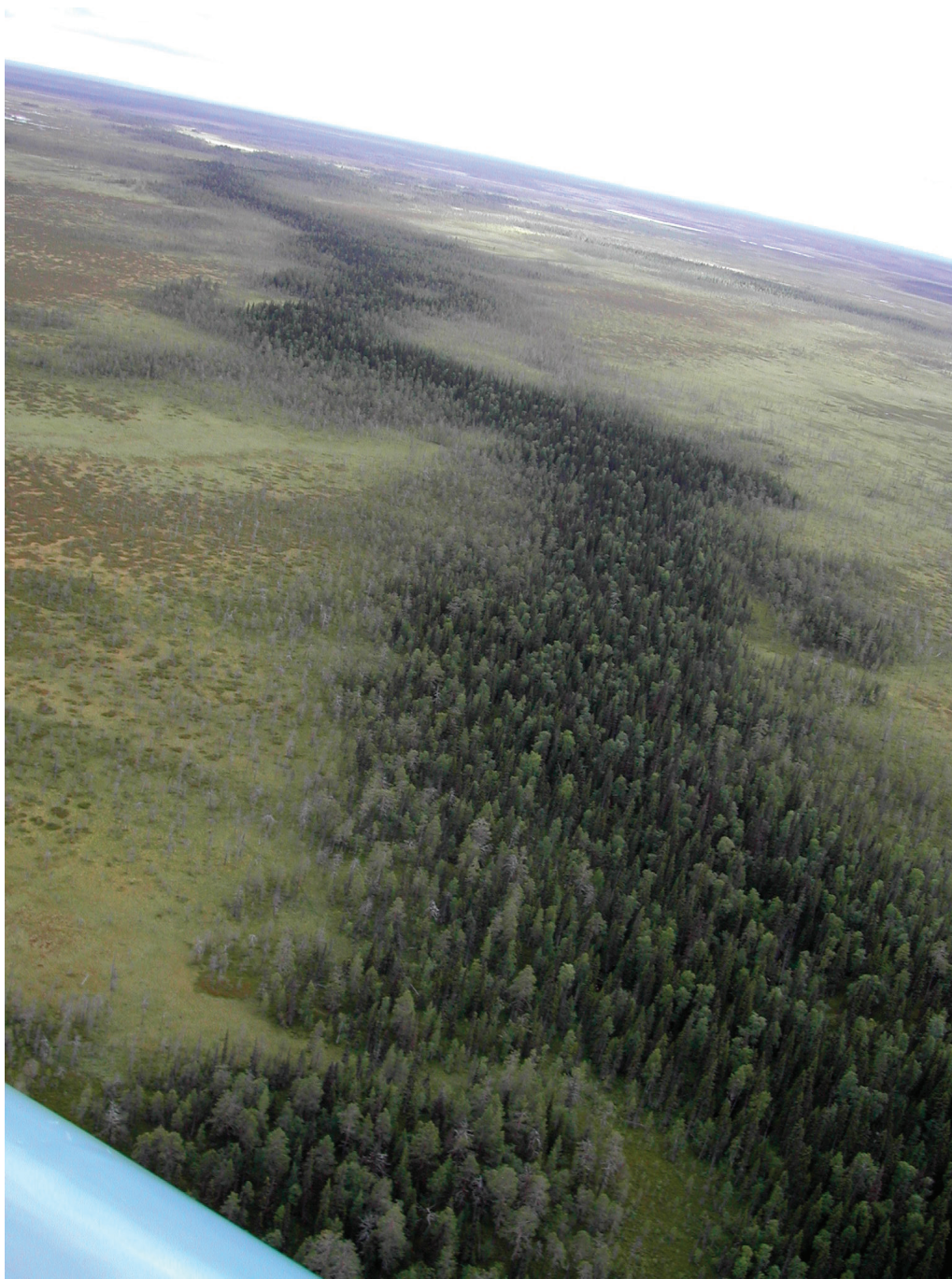


Figure 12. Natural “green (forest) corridor” among mires in the Pioza River basin as viewed from the helicopter. Photo: Alexander Davydov.

Among lichens the in Fennoscandia red listed species *Ramalina trausta* was recorded in one Spruce stand. The species is in Scandinavia most common in Norwegian Boreal Coastal Forest of Trondelag in Norway, and dependent on high humidity. The occurrence in Pioza spruce forest indicates a very special continental habitat quality.

112 species of flower plants was recorded. Mainly species typical for these habitat, but we will mention species like *Peonia*, *Clematis* and others red-listed in Russia and Archangelsk.

The cultural heritage - human influence: The Pioza River has from ancient times been a traditional water-portage passage of migrations of people from the east to the west. It has functioned as a water way from the White Sea to Pechora River in Komi, and further on - across the Ural Mountains to Siberia. The man's activities have though not been intensive here. The experts mentioned that beside this fact, there has been no serious influence on ecosystems. Some traditional nature use is represented here by a few existing and partly abandoned cabins for hunting, and fishing in the rivers and lakes by Russian villagers of Pioza River. Also Nenets people visited Pioza River annually during their seasonal migrations with reindeers. There were mentioned some typical marks on the trees which shows the borders of hunting grounds of villagers (**Figure 13**).

Recommendations: The expert opinion expressed in the expedition's resolution was to recommend organizing a protected area in the Pioza drainage. There was recommended to organize one extra fieldtrip for inventory of the nature complexes and biodiversity and in order to delimit the borders of future protected area.

Current status: For the realization of the recommendations of "Pioza-2009" expedition, a small expedition "Sula-2011" was organized in August 2011, leader V.A. Efimov. The expedition organized a cross-country vehicle trip through the taiga forest to the middle basin of Sula River 300 km and a 35 km hike to the source of River Bludnaya (Samosara). During this expedition new data was discovered which helps to determine the borders of the new protected areas of the Pioza and Mezenskaya Pizhma rivers' basins.

Nowadays IEPS UrO RAN works the environmental justification of the protected area in Pioza River basin.



Figure 12. Alexander Davydov near the old tree with carved marks. "Pioza-2009" expedition. Photo: Yury Logvinov.



Figure 13. Participants of “Pioza-2009” expedition: Ole Jakob Sørensen (Norway), Frederic Forsmark (Sweden) and Tapio Lindholm (Finland).
Photo: Alexander Davydov.



Figure 14. The leader of “Pioza-2009” expedition Valery Efimov.
Photo: Alexander Davydov.



Ole J. Sorensen and Victor Mamontov in an mature spruce stand crossing a small creak, one of the springs of the Bludnaya River – Mezheny Rayon.

3.7. The Sula – Bludnaya (Samosara) Expedition - 2011

The Expedition: This expedition in August 2011 was conducted to improve knowledge relevant for both “Pioza – 2009” and “Mezenskaya Pizhma – 2002” expeditions, organized and chaired by Valery A. Efimov (IEPS UrO RAN). It was a bilateral expedition with financial support from Finnish Environmental Institute (SYKE), Norwegian Ministry of Environment and North-Trondelag University College.

The expedition was carried out using motorized vehicles along the Leshukonskoye - Komi remote road along the Sula River in Leshukonskoye Rayon for about 300 km, staying a few nights at the former post stations of Lower Sula and Fominskaya with hikes into surrounding forests, and a 35 km hike from Fominskaya northward and across the watershed to the springs of The Bludnaya (Samosara) River - on of the tributaries to the Pioza River from the south (**Figure 15**).

The landscape and its biodiversity: Along the Sula River the expedition passed typical taiga forests with Pine stands on sandy soil along the river and Spruce dominated forests on more fertile and humid places.

There were large areas of Spruce - Birch stands of younger successions, probably remnants from a fire a 100 year ago or more. Pine forest has some places logged over the years, but intact in the way of still being of different age, a layered structure and the occurrence of dead trees standing and grounded. The Spruce forests commonly showed no significant traces of human use or former logging.

On the hike from Forminskaya to Bludnaya River some participants of the expeditions passed the watershed at the elevation at approximately 230 m.a.s.. Except for the near surroundings to the old roads, all forests can be regarded as natural forests aged to be of more than 250 - 300 years of age without any significant human impact. Crossing the watershed to the Bludnaya (Samosara) River and Bludnayas riversides we found old larch trees spread around in the forest and some places were Larch made up a significant number of trees in the stand.

We found a 100 Ha spot with a recent, natural forest fire. On the upper level of the watershed there were dry areas with Dwarf Birch (*Betula nana*) meadows hardly without any trees, and probably a long lasting vegetation cover remaining from the time when these areas was subarctic tundra.

Among wood decaying fungi indicator species for valuable habitats and red listed in Fennoscandia was frequently found. The documented occurrence of *Fomitopsis gigantea* on Larch and the in Archangelsk red listed *Hericium coralloides* (R) is worth to mention.

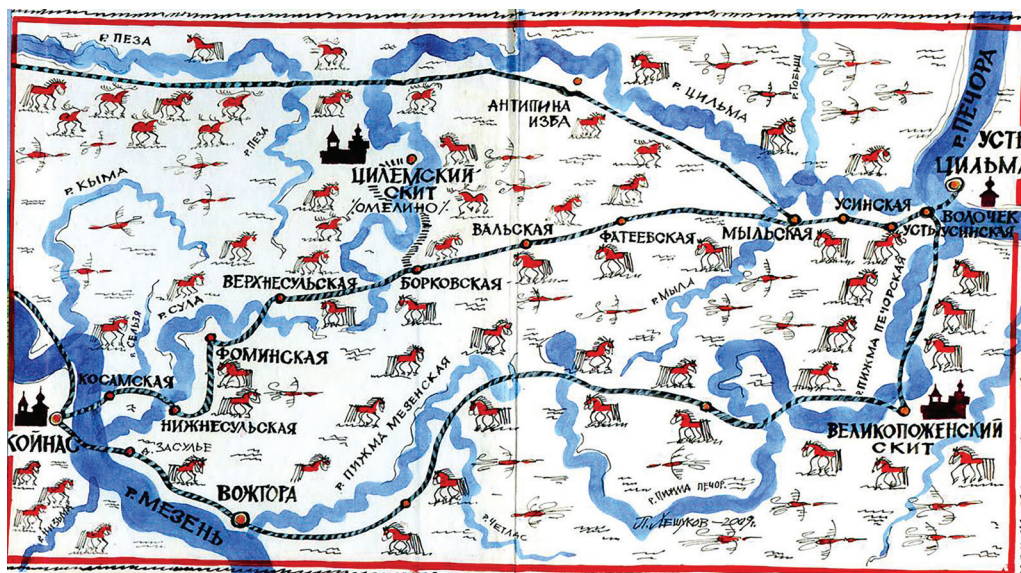
Forest wild reindeers could be documented to use the areas as we found several fresh tracks/signs and browsing marks on bog vegetation. Bears were numerous, and letjaga - Flying Squirrel (*Pteromys volans*) and burunduk – Siberian Chipmunk were observed.

The cultural heritage - human influence: Except for the nearest areas to the road and the 2 settlements traces of human activity were hardly observed and without any influence of the areas nature qualities.

There are a few hunting/fishing cabins along the Sula River and 1 place at Bludnaya River. Near to the settlements we found recently used snare sets to catch grouse birds, a tradition nowadays forgotten in Fennoscandia.

Recommendations: The unique natural old growth forest habitat complex covering vast areas connects the Pioza River and Mezenskaya Pizhma River systems is important and should be included in the plans for the Pioza and Mezenskaya Pizhma PAs.

Current status: A more detailed report is in process. The areas importance will be considered as supplementary or included into the plans in development for the Pioza and Mezenskaya -Phizmas possible nature protected areas by the IEPS UrO RAN.



Map covering the areas between the Petshora – Mezhen Rivers showing importance of the Sula and Pioza Rivers as ancient travel routes between Komi and Archangelsk.



Figure 15. From the expedition to The Sula River on remote road in the forest.
Photo: Alexander Davydov.



A hunters cabin near to the Bludnaya River.



The *Betula nana* vegetation at the top of the watershed between the Bludnaya and Sula Rivers.



A toad sitting on a rotten log in the humid spruce forest along the Pioza River.

4. SUMMARY AND CONCLUSIONS.

The expeditions have made their main conclusions given in different kind of statements and resolutions for each expedition. All visited areas can show up unique forest ecosystems with similarities, but also with important differences. To establish National Parks and/or Nature Reserves of large areas according to the suggested plan would be important to preserve boreal nature and biodiversity in itself with value for coming generations of the Russian and Fennoscandic people and will serve as examples of boreal taiga of world importance (**Figure 16**).

The Russian initiative to start a process of creating a plan for nature protection in Archangelsk is approved by the BEAR. The areas for possible future protection were regarded to be of common interest and importance for The Barents Region Countries, Europe and the World. *The expeditions have proofed this original statement.*

The authors of this summary report strongly advice the plans to be followed up and find its solution before it is too late. And we would give the process the following priority list for the remaining possible nature protection procedures. The processes could though best be developed more or less in parallel, but the stress level for possible protection is different. The priority list mainly takes this situation into regard. (The Onegsky Peninsula National Park was formally established in February 2013).

1: The Severnaya Dvina – Pinega and Yula River area.

The establishment of a Landscape Zakaznik in the Severnaya Dvina – Pinega River basins central areas not less than 400 000 Ha covering the inner parts of the Yula River Basin and surroundings. The preliminary moratorium on logging an area of 400 000 Ha for the next 10 years is a solid base for this process which we recognize to give troublesome socio-economical consequences for local societies and existing forest companies that have leased these forest. Compensations have to be worked out.

2: The Belomorsko – Kuloiskoe Plateau.

The existing Zapovedniks of the Belomorsky-Pomorsky Plateau should best be reorganized into a National Park and borders be reregulated and maybe also increase the protected area to include the whole Soyana River Basin.

3: The Mezensky Pizhma – Sula River Basins.

The Mezensky-Phizma and Upper parts of the Sula River basin in Leshokonsky Rayon should be joined into a Nature Reserve/National Park and create a common border to the Pioza River Basin suggested protected area.

4: The upper Pioza River Basin with tributaries

To establish a Landscape Zakaznik (NR) at the upper parts of the Pioza River Basin in the Mezensky Rayon and with a common border to the Mezheny-Phizma Protected area.

5: The Kozhozero Area.

To reevaluated the protection status of the Kozhozero Lanscape Zakaznik with the purpose to increase and improve it protection status into a Nature Park and elaborate a strategy of its development.

6: In addition we also recommend:

The experiences of the International Environmental Expeditions need to be continued. It is in the frames of International cooperation in nature protection that the creation of new Protected Areas can be most efficient.

The creation of new Protected Areas on the large territories of intact old-grove forests is long and rather complicated process, which takes time and need a lot of efforts. To organize a kind of International Fund, with the purpose to support the creation of large PAs with intact boreal forests, could be an efficient instrument for the creation and normal functioning of such areas.



Figure 17. View from helicopter of a large stand of intact forest. Here you also see trees killed by bark beetles. Photo: Alexander Davydov.

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6. APPENDICIES

Appendix 1:

Resolutions from the expeditions. (Resolutions were not given from all expeditions)

A: Resolution from the Kozhozero expedition - 1999.

B: Resolution from the Yula River expedition – 2001.

C: Resolution from the Pioza River expedition – 2009.

Appendix 2:

A: Statement from the international seminar on: Preservation of biological diversity and development of eco-tourism on specially protected nature territories in European North. The Onega Lake – White Sea tour with the research ship: Ecology. 3 – 9th August 1998.

B: Protocol from the Sojana Village meeting. August 2000.

C: Summary and closing statements from: The Nordic – Russian Conference on “The last large intact forests in North-west Russia: Protection and sustainable use. Steinkjer – Norway. December 2007.

Appendix 3:

Some results from bird and forest censuses in the Yula River basin 2005.

A: The relative abundance of woodpeckers in Yula forest and managed and fragmented natural old forest of Norway.

B: Examples of forest structures in an old, mature spruce stand and a younger succession stage of Yula natural forests.



The antler from a forest reindeer. Bludnaya River.

APPENDIX 1A:

THE RESOLUTION of the international ecological expedition to the region of lake Kozhozero (Onega region of Arkhangelsk oblast) Kozhozero, August 9-15, 1999

In accordance with Declaration of The Council of ministers of environment in Barents-Euroarctic region (Umea, Sweden, June 9, 1999) as well as to Russia's bilateral cooperation with Finland, Norway and Sweden and the recommendations from the workshop on protected areas in the Euro-Arctic Barents region and Northwest Russia (Tromso, Norway, November 23-25, 1998), activities for preservation of biological diversity and for creation of a network of especially protected nature territories (EPNT) are being executed in North West Russia.

The international ecological expedition to the region of Lake Kozhozero was the latest consecutive step in the execution of the above mentioned tasks, following the expeditions to Onega Pomorie in 1997 and to Belomor-Kuloi Plateau in 1998.

Representatives of nature protection bodies, forestry, administration of Arkhangelsk oblast and Onega region, as well as scientists and experts from Russia, Finland, Norway and Sweden took part in the expedition (list of participants annexed).

The main objectives of the expedition were:

- *To give a complex evaluation of the nature and of the cultural heritage of Kozhozero landscape zakaznik (sanctuary, or nature preserve), founded in 1992 on 178.6 thousand ha.*
- *To work out recommendations for the preservation of old-growth forests, biodiversity, landscapes, geological monuments, and cultural heritage.*
- *To work out recommendations for the development of the territory.*

The expedition worked according to the program (annexed) by making a helicopter tour above the zakaznik and by making over 175 km on field routes, from them 135 km by boat and 40 km on foot.

The participants were acquainted with various types of ecosystems, geology and geomorphology, and ecological landscape of the territory.

The expedition was acquainted in detail with Kozhozero Bogojavlensky monastery and concluded that it will be necessary to take into account the socio-cultural uniqueness as well as the value of the cultural and spiritual heritage of the territory.

The Russians and the foreign participants of the expedition, expressing each their personal point of view, came to the following conclusion:

1. Organization of Kozhozero landscape zakaznik in 1992 was a well-timed measure in order to preserve the nature and the cultural heritage of the Kozhozero region.
2. It is necessary to save this EPNT for a long time ahead.

The experts point out the natural state of the following elements in giving grounds for the above listed conclusions:

- *Typical and unique landscapes of European mid taiga*
- *Old-growth forests of different types on large areas (forests in the age of 200 years or more occupy an area over 50 thousand ha)*
- *Unique esker formations covered with old-growth forests with numerous traces of post fires*
- *Large biological diversity in typical and unique mid taiga nature complexes with insignificant anthropogenic effect (according to limited data 140 animal species including 26 rare or endangered in Russia and Northwest Europe, over 400 species of vascular plants, mosses and lichens, among them over 20 listed in the Red Book of Russia and in the Red Book of Arkhangelsk oblast)*
- *Mire ecosystems of different types including eccentric bogs and Karelian aapa unique for the region*
- *Lake and river system in its natural hydrological state, Kozhozero to be mentioned in particular*
- *Clearly expressed Precambrian formations in the topography, partly specific to Fennoscandia.*

The following objects of cultural heritage are of importance:

- *Archeological sites from the Neolithic epoch, early stages of metal, quartz and silicon manufacturing from the III – II millenniums before Common Era*
- *toponymic complex telling of the ancient presence of Saami people and Finno-Ugric tribes as well as of typical north-Russian toponimics*

A distinctive feature, the tradition of monk solitary life, is alive in Kozhozero region as the only place in the whole European part of Russia. The architectural ensemble of the monastery is located on Lopsky peninsula at Kozhozero. The spiritual tradition of Kozhozero Bogojavlensky male monastery has given to Russia a multitude of saints who has taken their place in the history of the orthodox religion. Now this spiritual tradition is reviving.

The Kozhozero region has a high recreative potential. The geographical location offers good perspectives for the development of tourism industry as the Kozhozero territory forms a link between the national parks ‘Vodlozezero’ and “Kenozero”, the projected park “Onezhkoe Pomore”, Solovetsky zapovednik-museum, and the town Onega.

The participants of the expedition:

- *Consider it necessary to include in the nearest future the whole Kozha river with one km broad zone along both of its banks into the Kozhozero landscape zakaznik.*

- *Recommend:*

- To improve the state of the local salmon population.

- To conduct scientific studies on the ecological specificities of Capercaillie, Reindeer, Moose, Wolverine and other taiga game species aiming at development of recommendations for their protection and possible use.

- Consider that the characteristics of the inspected territory completely correspond to both Russian and international criteria for national parks. However, taking into account the present economic state of Russia, organization of a new national park here is linked with a number of economic, judicial and administrative problems. At the same time, this unique and very valuable territory is endangered by destruction. The present status of landscape zakaznik is insufficient for its preservation and development.

Pressure from timber industry to restart cutting is increasing and the on-going geological expeditions break the zakaznik regime causing significant damage to Forest Service is not capable of ensuring proper preservation of the zakaznik. Finally, the stipulated time for Kozhozero zakaznik as EPNT is expiring in 2001.

- *Consider the preservation of this territory to be possible by increasing its status up to that of Nature Park. It will be necessary to take into account the experience of European countries in projecting biosphere reserves with application of methods of landscape ecological planning, in order to work out the project of Nature Park for Kozhozero zakaznik. For this, Kozhozero zakaznik should be regarded as one among the others in a system of the existing EPNT, i.e. the national parks in Northwest Russia and in the Barents-Euroarctic region. The reviving Kozhozero Bogojavlensky male monastery on the territory of the zakaznik should also be regarded. This approach will enable to settle economic interests with those for nature preservation.*

- *Note the importance and the necessity of both bilateral and multilateral international cooperation at all stages of the creation of the nature park.*

Turn to:

- *The Governor of Arkhangelsk oblast administration with the request of taking necessary measures for the creation of a nature park in order to preserve this unique territory.*
- *Federal Forest Service of Arkhangelsk oblast with the request of taking necessary measures in order to strengthen the protection regime in Kozhozero landscape zakaznik.*
- *State Committee of Environment Protection of Arkhangelsk oblast with the request of assisting Onega state timber enterprise in the creation of material and technical base for better protection regime in the zakaznik.*
- *See it expedient to form a working group for the realization of the proposed nature park on the territory of Kozhozero region (preliminary list of group members is annexed). It is suggested that the group will be formed under the administration of State Committee of Environment Protection of Arkhangelsk oblast.*
- *Note the increasing significance and value of international ecological expeditions aiming at creation and improvement of EPNT network in Barents-Euroarctic region.*
- *express their intention to prepare and conduct an ecological expedition to the eastern regions of Arkhangelsk oblast in 2000, in order to work out recommendations for the preservation of old-growth forests and biodiversity.*
- *consider it expedient to conduct an international seminar in Arkhangelsk in 2000, on state and perspectives of development of EPNT network in Barents-Euroarctic region.*

The participants of the expedition express their gratitude to State Committee of Environment Protection of Arkhangelsk oblast, to Institute of ecological problems in the North, Ural Division of Russian Academy of Sciences, and to Onega timber state enterprise, for the organization and realization of the expedition.

Signed by:

Knut Fossum – Head of the Norwegian Group.

Aimo Saano – Head of the Finnish Group.

APPENDIX 1 B

THE RESOLUTION THE INTERNATIONAL ECOLOGICAL EXPEDITION TO THE RIVER YLA (PINEZHISKY AND VINOGRADOVSKY DISTRICTS OF THE ARKHANGELSK REGION)

August 5-15, 2001

According to the Declaration of Ministerial Council of an Environment of the Barents Euro-Arctic region (Umeå, Sweden, June 9, 1999), and also within the framework of bilateral cooperation with Finland, Norway and Sweden in Northwest of Russia carries out works on preservation of a biological variety, perfection and development of a network of especially protected natural territories (NPT).

The international ecological expedition to pool of the river Yla is the next stage in the above-stated works. Similar expeditions already were held:

- To the Onega peninsula (1997);
- To the Belomorsko-Kouloiskoe a plateau (1998);
- To Kozhozero landscape reserve (1999);

The basis for realization of the given expedition was:

- The recommendations of the International ecological expedition to Kozhozero of the Onezhsky district of the Arkhangelsk region (August 9-15, 1999);
- The decision of the First international forum on preservation of habitats (November 17-21, 1999 Trondheim, Norway);
- The regional program of development of NPT on the territory of the Arkhangelsk region.

The purpose of expedition: a complex estimation of a condition of old-age woods, biovariety, landscapes with the purpose of development of the recommendations on their preservation in territory of the Arkhangelsk region.

The basic tasks of expedition:

- Inspection and expert estimation of the natural importance of territory of pool of the river Yla in development of a network of NPT of the Arkhangelsk region according to the international requirements.
- Development of the recommendations on preservation of old-age woods, biovariety and natural heritage of pool the river Yla.
- Definition of ways of the international cooperation on preservation of a natural heritage and development of this territory.

Structure of expedition: 30 persons among them of the experts and science officers 15 persons - scientific, experts, workers of nature protection organizations from Russia, Finland, Norway, Sweden.

The participants of expedition(dispatch) have made test flight of territory of pool of the river Yla up to its sources inclusive (about 150 km), 40 km -water routes, 45 km - foot routes have passed in total field routes about 85km. During expedition its participants have got acquainted with various types of ecosystems of old-age woods, landscape-ecological features of territory, condition of a biovariety and cultural heritage (system of the hunting loghuts and Ura village).

On the data the Greenpeace, nature protection organizations of the countries of Europe the most complete files and the sites of old-age woods were kept in Russia, and in particular, in the Arkhangelsk region. Except for Belomorsko-Kouloiskoe plateau and Onega peninsula is sites of woods in the country between rivers Northern Dvina and Pinega (pool of the river Yla), pools of the rivers Vashka and Mezenskaya Pizhma.

On the data of Arkhangelsk forest management expedition in the Arkhangelsk region was kept of 11 millions hectares of ripe and overmature coniferous woods, from them about 7 million hectares poorly mentioned by economic activity of the man and can be referred to old-age, virgin forests. In a subzone of the Middle taiga such woods were kept basically in the country between rivers Northern Dvina and Pinega.

Having get acquainted with natural complexes of pool of the river Yla, the participants of expedition came to the conclusion, that the old-age woods of this territory are necessary for keeping on long prospect by creation new NPT and the full of nature protection measures and rules at planning and during cabins of woods (water-protecting zones, sites of a wood with presence of rare and disappearing kinds of plants, habitats of rare and disappearing kinds of animals, lichen pineries, sites of a wood at sources of the rivers etc.).

By the basis for this purpose the participants of expedition (dispatch) consider (count) presence of all complex of a natural heritage kept practically in a natural condition:

- Typical and unique landscapes of an average taiga;
- The old-age woods of different types on the large areas, basically are woods in the age of 160 and more (on modeling trees the age made till 450 years);
- Unique formations of old-age woods with numerous traces of fire influence at different stages succession;
- The large biological variety of territories typical and unique Middle Taiga complexes with insignificant influence of the anthropogeneous factors (during expedition is revealed more than 20 kinds of plants brought in the Red book of the Arkhangelsk region and the Red book of Russia);
- Is marked large species' variety and high number of feathered predators (golden eagle, erne, osprey, buzzard, goshawk, sparrow hawk, peregrine);

- High density hunting animal (wood marten, fiber, otter, bear, glutton, capercaillie) is marked; the population of wood northern deer requires restoration;
- Natural hydrological system of the rivers and lakes. On the cleanliness the river Yla and its inflows can be the standard at definition of pollution and realization of research works. More than 15 kinds of fishes most valuable of them a salmon, white-fish, umber live in the rivers, the stocks of these kinds require restoration.

The important objects of a cultural heritage are submitted:

- Archeological sites of epoch of Neolith with silicon industry 2 millennium BC;
- toponymic complex showing of presence in the given territory in the Past ancient Sami of the population and Finno-Ugric tribes, and also characteristic North-Russian toponymics;
- Distinctive feature of the upper part of the river Yla is the presence remote village Ura on its inflow to the river Ura; village Ura has kept a traditional lay-out, the monuments of wooden architecture, such as houses (five-wall and six-wall) and barns on racks are submitted; the significant interest is represented by system traditional hunting and haymaking time log huts.

The examined territory has high recreational potential.

The participants of expedition recommend:

- To develop the project of preservation of old-age woods and biovariety in the country between rivers of Northern Dvina and Pinega for the future generations. The participants also mark necessity of development of the project of NPT and protected territories at cooperation and financial support of northern countries;
- In 2002 to carry out in Arkhangelsk the international seminar on preservation of a biovariety in old-grove forests;
- To prepare and message the international ecological projects on study of features of ecology of populations of animals and plants in old-age woods of pool of the river Yla. In particular, to consider expedient in examined territory to create international field station on study of ecosystems of old-age forests;
- To prepare the booklet by results of work of expedition in the given territory;
- To continue multilateral cooperation by organization of new expeditions and to plan expedition to pool of the river Mezenskaya Pizhma in 2002;
- To consider an opportunity of creation of a museum in Ura village, showing values of landscape and culture;

International ecological expedition addresses with request to participants of Meeting of the Ministers of an environment of the countries Barents Euro

Arctic region, which is held on August 21, 2001 in Norway to pay attention to importance of preservation of old-age forests and biovariety.

The participants of expedition address to the chapter of Administration of the Arkhangelsk region, Committee of natural resources on the Arkhangelsk region, Committee of ecology of the Arkhangelsk region with the request to accept necessary steps for preservation of old-age forests and biovariety in the country between rivers of Northern Dvina and Pinega

The participants of expedition express gratitude to Committee of natural resources on the Arkhangelsk region, Institute of Ecological Problems of the North of Ural branch of the Russian Academy of Sciences for organization and realization of expedition.

HAVE SIGNED:

- From Russia Valery Efimov
- From Finland Tapio Lindholm
- From Sweden Mats-Rune Bergstrom
- From Norway Ellen Arneberg

Resolution of the International Environmental Expedition "Pioza-2009"
Archangelsk, Russia 17.08.2009

In August 10-17, 2009 there was organized the International Environmental Expedition "Pioza-2009", which was held at the Mezen District of Archangel Region. The expedition organized according to the decision of Sub-Group for Nature Protection of the Group of Barents Euro-Arctic Region for the Environment Protection. The expedition organized by the Institute of Ecological Problems of the North of the Ural Branch of the Russian Academy of Sciences together with Finnish side of the Finnish-Russian Working Group for the Protection of Nature. The Ministry of Environment of Finland, Swedish Environmental Protection Agency and the Norwegian Directorate did the financial support of the expedition for Nature Management. The expedition were participated by 14 experts, researchers and specialists from Russia (Archangel Region, Komi Republic), Finland, Norway and Sweden, and also 6 persons of technical personnel including local guides (Mezen and Safonovo village).

The aim of the expedition was an expert evaluation of the conditions of the nature complexes, forests, mires, biodiversity and historic-cultural heritage, as well as elaboration of the recommendations for their protection and use.

During the expedition there were arranged the helicopter flight observation of the territory as well as nature study, during which there were realized water routes general length around 60 km (by the rivers Pioza, Rochuga and Bludnaya) and walking routes of general length of 35 km. In the result of the field research, most of the different nature complexes and ecosystems of the territory studied.

The visited area is a high conservation value area of international importance. It is a part of a large boreal wilderness area with an intact boreal ecosystem. Natural geological and ecological processes form the landscape and the biodiversity. Neither historical nor present human impact seems to influence biodiversity and landscape in a significant way, which indicates that the area of Pioza river basin is an intact boreal landscape with long ecological continuity. The forests along the visited rivers are corridors in a mire landscape. These forests are intact old-growth forest with a high and unique biodiversity and indicate that forest corridors along rivers have an important function in a boreal landscape.

In addition to the values of the natural landscape, the participants took into consideration the traditional land use, such as hay meadows close to the river and old tracks and symbols on trees.

Present human activities are low intensity hunting and fishing by local inhabitants. Historical use includes sparse logging, some few settlements including haymaking, migration/transportation routes, hunting and fishing.

This area represents the nature complexes that formed as the result of continuous nature succession's processes. The characteristic features of the given territory is a mosaic landscape with a presence of the nature environmental corridors, which connect the huge areas of mires' ecosystems into one big nature complex, which provides a rich variety of habitats for biological diversity.

The rivers are unique systems, which changed in time and space, and which provides nature successions, forms natural habitats, flora and fauna.

The forests have all of the intact old-grove forests characteristics. This includes both pine and spruce forests and high value aspen stands. The rivers, forest fires, and gap-dynamics formed the structure and dynamics of the forests. The abundance of old-growth indicator species was substantial. Some examples include Siberian Jay (*Perisoreus infaustus*), the rare wood fungi (*Amolycystis lapponica*, *Perenniporia subacida*) and the lichens (*Ramalina thrausta*).

The spruce forests along the rivers are extremely productive with spruce trees of more than 30 meters. The spruce forest also shows an overall high species richness. This forest shows

some unique phenomenon for the forests of Northern areas above the 65 degree of Northern latitude.

The mires represent the valuable complex of eccentric bogs and aapa mires, which have undestroyed hydrologic system. The aapa mires are new type of mires on the territory, which were never described here before.

The riverbanks and meadows are rich in vascular plants species.

Among animals, the brown bear draw the attention of the participants of the expedition. The traces of the bear used-to life, which mentioned everywhere (marking trees, paths, sleeping places, excrements) show the rather high density of the animal.

The participants of the expedition discussed the existence of the largest population of the northern wild forest reindeer of the European North in this area. The information about the decrease of the population of the reindeer nowadays is alarming and be taken into further consideration by responsible authorities. The participants of the expedition address to the responsible authorities for the measures to monitor and restore the population of the northern wild forest reindeer.

For this area, there is typical presence of big birds-predators, such as white-tale eagle, osprey, honey-buzzard, goshawk, hobby, merlin.

In general, the inventory of the biodiversity of the area not had done yet which needs additional study.

The participants of the expedition takes common conclusion about the area which have a number of special high value characteristics, and which characteristics pick it out among other territories of the European North. It is of outmost importance to save those nature complexes for a long perspective.

The participants of the expedition supposed expedient to realize the International project for inventory of biodiversity, nature complexes and cultural heritage of the area, including the northern wild reindeer.

According to the opinion of the participants of the expedition the most efficient measure for protection and use of the nature and cultural heritage is to establish an area protected by law. This is a reason to reserve this area for a convenient form of PA. The foreign participants conclude that the form and area is a matter for Russian experts and authorities.

The creation of a protected area is of outmost importance in an international context and will be a substantial contribution within the framework of the convention of biological diversity and preservation wilderness areas for wildlife and ecotourism. The proposed PA will be an important element of the environmental infrastructure and a significant part of the process of building of the environmental corridors (Timansky green meridian).

In addition, the area could be a stationary for the researches of the climate changes and its influence on biota.

The participants addressed to the Sub-Group for Nature Protection of the Group of Barents Euro-Arctic Region for the Environment Protection for assistance with the organizing of a session of the VI Habitat Contact Forum devoted to the results of the International Environmental Expedition "Pioza-2009".

The participants of the International Environmental Expedition "Pioza-2009" express their gratitude to the Sub-Group for Nature Protection of the Group of Barents Euro-Arctic Region and to the Finnish side of the Finnish-Russian Working Group for the Protection of Nature for the assistance, which has made it possible to organize the expedition.

On behalf of the experts the document signed

Russia
Finland
Norway
Sweden

Valery Efimov
Tapio Lindholm
Bård Øyvind Solberg
Nils Olof Höjer

APPENDIX 2 A.

Statements from the International Seminar: “Preservation of biological diversity and development of eco-tourism on specially protected nature territories in European North”, at The Research Ship; ECOLOG. The Onega Lake – The White Sea: August 3-9th. 1998.

Based on presentations and discussions given by the 26 participants from Russia, Sweden, Finland and Norway, after visiting several protected and suggested protected areas in Russian Karelia and Archangelsk the following statements were given:

1. National nature conservation policy and strategy shall be based on fulfillment of international conventions and on national needs for nature protection. The establishment of nature reserves shall be based on progressive national conservation strategy, on biodiversity conservation programs and on thorough inventories of nature values and biotopes. Biodiversity conservation program shall contain a network of strict nature reserves, national parks, other protected areas and also valuable nature environments and biotopes in production forests.
2. Forest protection is an important part of the conservation strategy. A network of forest reserves should be built up covering representative landscape and forest types. The human culture is also a part of the protection system (or network). Cultural landscapes shall be conserved as part of nature reserves and intensified management should preserve the state of areas.
3. Development of protected areas in Barents Region should be recognized as a common responsibility of all states in the area. We recommend to establish a network of protected areas in the Barents Region based on a common strategy and action plan, and to develop a monitoring system on the biodiversity and its threats.
4. Kizhi and Solovets Islands are good examples on popular tourist resorts, which should be developed by expanding supply of services to provide longer visits and more benefits to the local economy. Tourism infrastructure shall be developed gradually in vulnerable areas to avoid failures in investments and destruction of nature. Eco-tourism in protected areas shall be promoted as an excellent means to have people acquainted with the significance of nature values and the necessity of nature protection.
5. The staff of national parks and other protected areas should be trained to fully understand the means and measures of nature conservation. It should promote the management of protected areas if the officers in charge had a university level education in ecology and conservation.

6. Public awareness building and other promotion campaigns shall be used to familiarize people in nature conservation and to change their behavior and attitudes from destruction to respect the nature.

7. Research and monitoring of protected areas shall be increased and provided with additional resources, better equipment, and information systems.

8. Exchange of managers, administrators and scientists between North West Russia and the Nordic countries shall be promoted and the collaboration shall be supported.

9. For solving the specific area related issues the following recommendations were proposed:

1* The key problem is a conservation of samples of primeval forests in different taiga landscapes of Europe. Solution of this problem will guarantee a conservation of natural diversity of terrestrial biota. In order to achieve this it is necessary to complete an establishment of network of protected areas with primeval forests in Eastern Fennoscandia. For that purpose, the first group forests existing in Russian part of taiga zone have a great significance in forming biotopes.

2* For conservation of unique endangered landscapes of the Karelian Isthmus, it is not enough to establish small reserves. In conditions of the Isthmus, the conservation of valuable natural objects will demand an establishment of the system of nature protection areas with differentiated nature use regimes.

3* Upon preliminary data, there still exists a unique natural-territorial compound with virgin forests on Belomorsk-Kuloiskoi plateau. Field survey of the area, aiming at establishment of nature reserve, is necessary.

4* Nature protection areas must be considered as one of the most important areas in development of ecological tourism and ecological education for people.

5* Governmental bodies should consider the programs of state support for national parks and reserves as key ones in compilation of federal and local budgets.

APPENDIX 2 B

PROTOCOL

of intentions between representatives
of Sojana village; State Committee of environmental protection of Arkhangelsk
region; Institute of Ecological Problems of the North, Ural Branch, RAS;
Svanhovd Environmental Centre;
Department of Environment, County Administration of Vasterbotten;
Directorate for Nature Management;
International Contact Forum for Habitat Conservation in the Barents Region

Sojana village

22.08.2000

Representatives discussed matters related with establishment of the ecological information centre in Sojana village.

The sides agreed on the following:

1. To organise the trip of the representatives of Sojana village, 4-5 persons, to Vodlozero National Park. The expenses for the trip are to be covered by Svanhovd Environmental Centre. The names of the representatives and dates/route for the visit are to be set by Head of Sojana village local Administration in agreement with Goskomekologii Arkhangelsk.
2. To start preparatory work for establishing Sojana village ecological information centre. Centre should be the place for distribution of ecological information among local population, be managed by population of Sojana village, and contribute to improvement of knowledge and relations of people of Sojana village and staff members of nature protection institutions. Institutions represented on the meeting define responsible persons for further project development, set and adopt the plan of activities, estimate of expenses, terms of work, sign the separate agreement on establishing Sojana village ecological information centre in accordance with necessary terms.
Sides agreed to start the concrete work in establishing centre by 31.12.2000.
3. To define the aims and objectives of the centre, spheres of its activities and work priorities taking into account, first of all, opinions and recommendations of the Sojana village local population.

Signatures of the meeting participants:
(17 signatures)

APPENDIX 2 C:

The Nordic – Russian Conference on
**The Last Large Intact Forests in North-West Russia:
 Protection and sustainable use**
 Steinkjer/Lierne, Norway
 December 4th – 7th 2007

FINAL EDITION

SUMMARY AND CLOSING STATEMENT

I (Introduction)

The safeguarding of large forested areas in order to reduce the loss of biodiversity and the vision of sustainability based on wise use of renewable natural resources is highly recognized by international fora like the European Union (EU), The Barents Council (BEAC), the Convention on Biological Diversity (CBD) and the Ministerial Conference on the Protection of Forests in Europe (MCPFE).

On December 4 – 7, 2007 in Steinkjer/Lierne, Norway, a conference and workshop focusing on this important theme took place with specialists from forest management, forest industry, environmental management, researchers and non-governmental organizations from Finland, Norway, Sweden, Ukraine and Russia.

The aim of the conference was to let people with ecological, economic, social and cultural interests in the large intact forests of North-West Russia meet and discuss the challenges connected to protection and sustainable use of these areas. The participants of the conference represented a uniquely broad representation of actors and stakeholders representing all dimension of sustainable forest landscape management. The conference's focus was on balancing the conservation and use of natural resources in the large forest areas in the Russian Federation's NW, including goods, services and values.

The conference was organised by the University College of North Trøndelag (HiNT), Norway, the Norwegian Directorate for Nature Management (DN), Archangelsk State Technical University (ASTU), the Swedish University of Agricultural Sciences (SLU), Finnish Environment Institute (SYKE), Tampere College, Kuru Institute of Forestry and WWF. The meeting was hosted by HiNT and DN with main financial support from the Nordic Council of Ministers.

II (Background)

Nordic institutions like HiNT, DN, SYKE, SLU, and WWF have had close cooperation with North-West Russian institutions for several years on protection and sustainable use of forest.

Finland, Norway, Russia and Sweden are committed to the MCPFE and Montreal processes on sustainable forest management, European Landscape Convention and the Millennium Development Goals of significantly reducing the loss of biodiversity by 2010.

Forest landscapes provide goods, services and natural and cultural values. Balancing the use and conservation of these dimensions involves quite different challenges in the Nordic countries compared with North-West Russia. However, a common desire is to strike a balance and implement conservation and sustainability policies of different kinds.

Biodiversity is a common challenge. A considerable proportion of the World's biodiversity is connected to intact forest. In total 25 percent of the world's forests are in Europe. More than 80 percent of this forest is in the European part of the Russian Federation. About 74 percent of Europe's total forests are today classified as semi-natural or plantations.

The remaining large intact forested areas however are located in the northern part of Europe only, and mainly in the Russian part of the Barents Region. These forests make up about 14 percent of the total forest area of European Russia, and the vast majority of these large forests are located in the most remote areas and often on unproductive sites.

As of today, less than 5 percent of Europe's forests are protected with the main objective to conserve biodiversity. Most of these protected areas are small. The aim of these protected forest areas is to contribute to securing global biodiversity values for future generations. The extent and functionality of these protected area networks are, however, recognized as being far less than the amount needed to achieve this goal.

In a European context conservation of large intact forests in North-West Russia, and in Komi and Arkhangelsk in particular, is recognized as an efficient way to sustain biodiversity in terms of species, habitat and ecosystem functions. The reduction in forests available for harvesting may, however, be significantly reduced for local timber enterprises.

III (Topics)

During the conference the experts paid attention to the following topics:

- The need and possibility to secure global biodiversity values by designation of forest protected areas for the future.
- Ways to develop sustainable use and management of diverse resources and values including:
 - Implementation of sustainable forest management as well as genuine economic, social and cultural progress at national and regional level in Russia and the Nordic countries.
 - Forest legislation and forest certification as tools for sustainable forest management on local and regional levels. Social platforms for local and regional governance
 - Transdisciplinary knowledge production including education and vocational training, and applied research.

IV (Main findings)

The content of presentations and discussions allow some main conclusions to be drawn:

The large intact forests in North-West Russia are important (1) for biodiversity, (2) as a source of timber to the regional forest industry and (3) for non –timber forest products for local people. The dilemmas discussed during the conference concerned how to combine these interests in different forested areas in the Barents Region.

There was a general agreement that preferably some of the large forested areas should be left intact. Several presentations looked into different possibilities of making a network of protected areas (green belts, green meridians, world heritage sites etc) in order to fulfil the obligations taken on by signing the Convention on Biological Diversity. A more intense use of secondary forest was discussed in order to mitigate the economical consequences of leaving some of the last old growth forests intact.

The conference participants also agreed upon the importance of implementing sustainable forest management (SFM) in regions with large intact forests. SFM has to take into account all actors and stakeholders at all levels. This means the whole range from local and regional level (eg timber industry, local people, tourists) to international conventions and agreements (CBD, MCPFE, FSC, Barents Cooperation (BEAC) etc).

Implementation of sustainable forest management (SFM) in regions with large intact forests has to take into consideration the different outcomes from the forest such as ecological, economic, social and cultural. The implementation of SFM also has to take into account systems of governance that are representative of resource users, inclusive and participatory and that take into account the entire landscape and include all sectors. The experiences from the existing arenas aimed at achieving sustainable forest landscapes (like Model Forests and Biosphere reserves) were presented and evaluated.

The ongoing radical changes in forest sector and organisation in the Russian Federation, new demands of the forest market and new challenges in the forestry in the Western European countries require a change in the educational system. Ecological and socio-cultural dimensions of sustainable forest management are not well reflected in the present education system. The number and types of desired professionals in the forest sector is changing dramatically. New professionals with a wider range of skills at all levels are needed.

The forest health in North-West Russia (especially in the Arkhangelsk region) and the amount of dead and dying trees were addressed. The participants discussed the causes of this death in the context of natural ageing, extreme weather events, climatic change, beetle attack, and changed hydrology and human impact.

The certification of the Russian forest (FSC, PFS), inventories of forests biological and economical values and the evaluation of the forest biodiversity were also important issues at the conference.

The importance of the old sacred groves, trees and other cultural elements of the forest are already recognised by international organisations (eg the Delos Initiative of IUCN/WCPA) and were highlighted at the conference. These elements are mainly found in connection to former and present settlements.

The economic return from the forest is important for the region as a whole and not necessarily for local people living close to the forest massifs. Measures taken towards safeguarding these large intact forest areas for the future has to take this into account.

The Dvinskoy, one of the largest forests still intact in the Arkhangelsk region, was addressed especially at a workshop following the conference, and the participants discussed several problems and possibilities in maintaining this area intact for future generations.

V (Recommendations)

The conference participants expressed the need to follow up on these important issues and agreed upon the following recommendations;

1) Forest protection and sustainable forestry

The remaining large intact forests of North West Russia are unique both on Global, European and Russian scales. All stakeholders and actors representing different sectors and levels of governance need to join efforts to find solutions for conservation and sustainable use of these forests. The large intact forests should also be taken into account in international agreements both within biodiversity and climate.

2) Ecosystem Service Assessment

An Ecosystem Service Assessment (ESA) for the last intact forests of North-West Russia should be recognized as an important tool for assessing the total value of these forest systems on local, regional, national and international scale. Being a global heritage and responsibility, ESAs for these forests could preferably be initiated and supported financially in collaboration with international bodies (UN, CBD, EU).

3) Knowledge exchange

Exchange of knowledge between the Nordic countries and the North-West Russia is crucial in order to implement policies on protection and sustainable forest management in local landscapes.

4) Cross boundary cooperation

Cross boundary cooperation should be initiated both within the North-West Russia, and between the countries in the Barents Region. Representatives from Arkhangelsk Region suggest initiating cooperation with the Komi Republic for protection and sustainable use of large intact forests on the border between Arkhangelsk Region and Komi Republic. It would also be valuable to support transboundary Norwegian-Swedish, Russian-Finnish and Norwegian-Russian initiatives.

5) Climate

The possibility of establishing a system of climate quota in accordance with the Kyoto Protocol should also be addressed. A suggestion is to offer the international society the possibility to compensate logging companies that have originally leased land in the intact forest areas in order leave the areas unlogged.

6) Industry and rural development

The future perspectives of the forest industry activities and rural development connected to intact forest areas need to be addressed including measures to secure the health of the forest.

7) Use of secondary forest

Specialists underline the great values that lie in more effective use of the secondary forest outside the old growth forest areas.

8) Education

Systems for education, vocational training and social learning that are adapted to the ongoing changes in forest management need to be developed. There is an urgent need to create of modern education materials for policy makers the general public, planners, managers and technicians, and academic studies.

9) Social and cultural consequences

The social and cultural consequences of leaving the large forest areas intact vs logging them should be assessed on local, regional and international levels. The experiences from the existing arenas aimed at achieving sustainable forest landscapes (like Model Forests, Biosphere Reserves) should be further evaluated, and results should be disseminated among interested partners.

10) Model forest - Arkhangelsk

To solve existing challenges in management of the intact forests, a Model Forest in Arkhangelsk region should be developed as an arena for implementing the best national and international experience with participation of all stakeholders.

There should be 2 main concepts for the Model Forest:

1. Development of intensive forestry in secondary forests (the southern part of the region)
2. Protection and sustainable use of forest and non-forest resources in the watershed of Northern Dvina and Pinega River (Dvinskoy).

11) Investigation of last large intact forest

The protection and use of last large intact forest massifs in Arkhangelsk and Komi, such as the Dvinskoy Forest, needs to be addressed especially both nationally and possibly through an international ad hoc task force.

VI (Final remarks)

The different organisations present at the conference expressed the need to find possibilities for future cooperation and expressed their interest in joint projects concerning conservation and sustainable use of the last intact forests of North-West Russia.

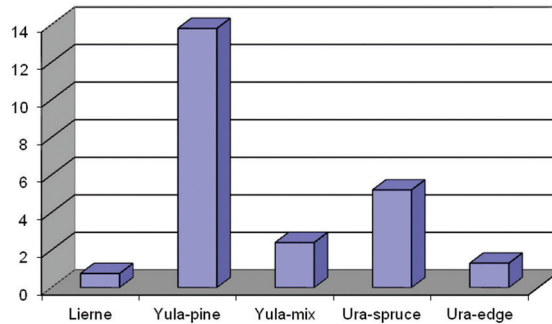
The participants also recommend through the Barents Council, to investigate how the international society could contribute to safeguarding Europe's last old growth forests, located in NW Russia.

The conference participants strongly expressed the importance to provide the messages from this conference to the Federal Agency of Forestry of the Russian Federation, The Barents Council (BEAC), The EU, CBD, MCPFE, IUCN, WCPA and other relevant organisations and institutions.

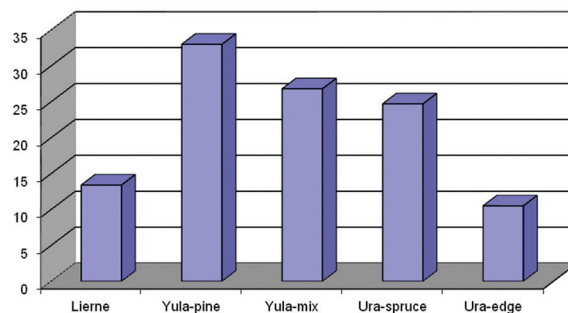
The Norwegian Directorate for Nature Management will in agreement with the other organisers of the conference, take the responsibility to distribute this summary and closing statement.

Lierne, Norway, 7th December 2007

APPENDIX 3 A

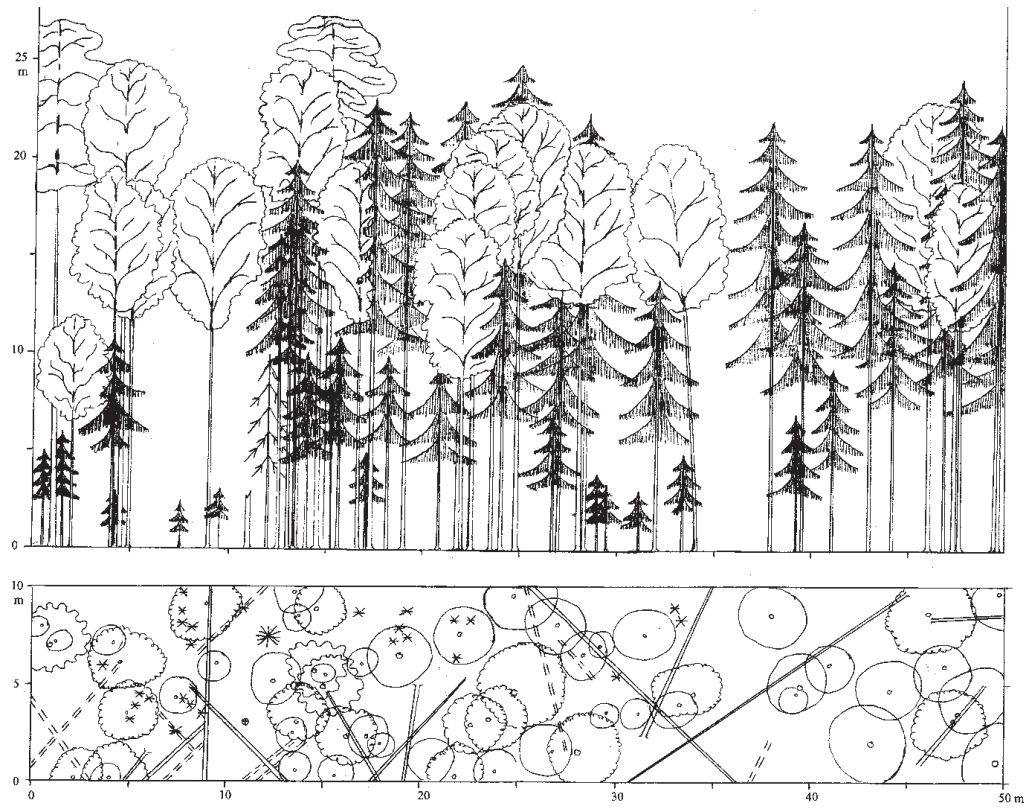


The relative contribution from the woodpeckers in the total bird communities in the five surveyed areas of Lierne in Norway and in different intact forest societies near the Yula River. (Thingstad et al. 2006, 2009).

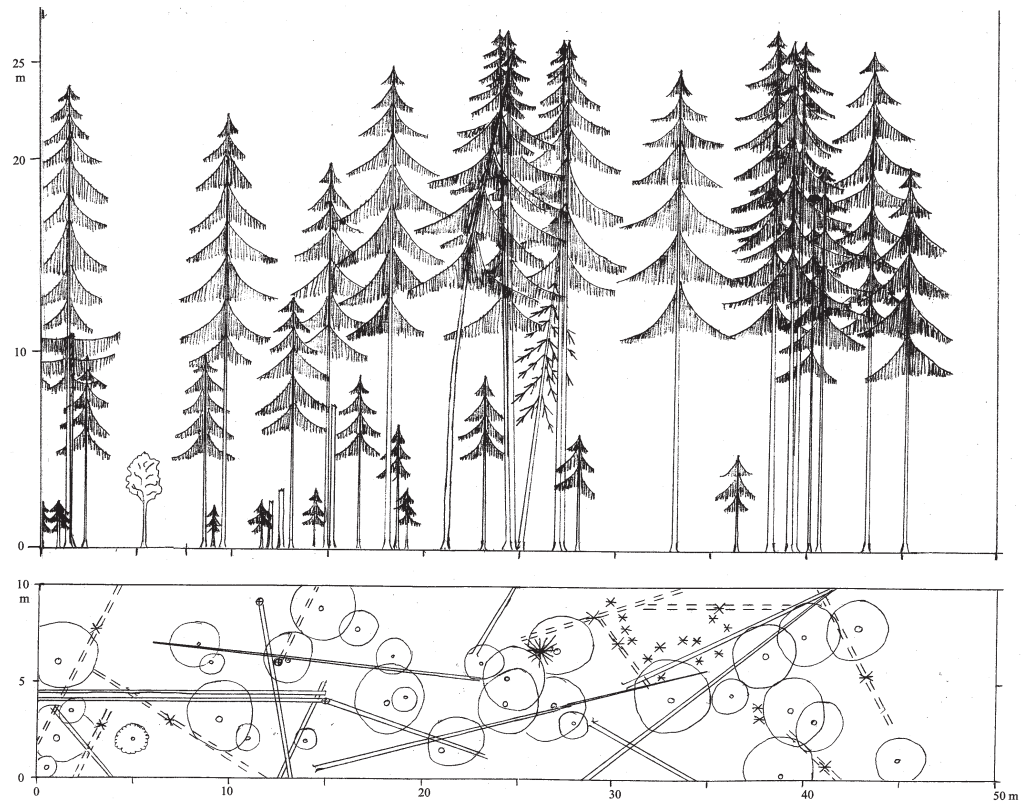


The relative contribution from hole- and snag-nesting bird species (in the total bird communities in the five surveyed areas of Lierne in Norway and in different intact forest societies near the Yula River. (Thingstad et al. 2006, 2009).)

APPENDIX 3 B



A mixed stand of spruce, pine and birch in early succession stage. The pines have survived a fire 100- 150 years ago, and are about 250 years old, and the spruce and birch have generated after the fire. Now there is a tough competition for survival between individual trees and species. In this struggle the birch will gradually loose, the spruce and pine will be the winners and the stand will be dominated by spruce with a few pines mixed in. (Bjelkåsen et al. 2009; Sorensen et al. 2013).



Vertical- and horizontal projections of a spruce stand in a medium- or late succession phase. Most of the fallen logs are from the last few years. In these gaps regeneration will appear and the stand will develop into a multi-storeyed and multi-aged stand (Bjelkåsen et al. 2009; Sorensen et al. 2013).

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